

THE NATIONAL HOSPITAL RATE-SETTING STUDY:
SUMMARY OF CURRENT FINDINGS ON THE EFFECTS OF HOSPITAL PROSPECTIVE PAYMENT SYSTEMS

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In 1978, the Health Care Financing Administration (HCFA) funded an evaluation of 15 hospital prospective reimbursement (PR) programs. The study is called the National Hospital Rate-Setting Study (NHRS) and was undertaken on a contractual basis by Abt Associates Inc., a research firm in Cambridge, Massachusetts, which specializes in the evaluation of large-scale social and economic programs. Along with Abt Associates Inc., two subcontractors have played a major role in the study: Health Economics Research, Inc., and Policy Analysis, Inc., both located in Massachusetts.

Presented here is a summary of the results currently available from the study. Findings cover not only the effects of prospective payment on hospital costs, but also the effects on a wide range of other outcomes, including hospital revenues, patient outcomes, investment spending, and cost-shifting among payers. This is the first time that this comprehensive set of findings has been reported.

Background

The funding of this major evaluation effort by HCFA in 1978 represented one more step in the series of activities that the federal government had undertaken to support the development and implementation of prospective reimbursement methods and to evaluate their effectiveness in containing hospital cost inflation.

Between 1972 and 1978, the Social Security Administration (SSA) and then the Health Care Financing Administration (after it was formed in 1976) supported a number of different developmental studies and experiments in support of prospective reimbursement. SSA and HCFA supported the development and/or implementation of PR programs in over 10 states, either by providing partial funding for developmental activities, and/or by participating directly in some programs, that is, agreeing to pay hospitals in those states, amounts established by PR programs.

In 1974 the Office of Research and Statistics of SSA funded evaluations of seven of the early prospective reimbursement programs operating in six states: Pennsylvania, New York (upstate and downstate), New Jersey, Rhode Island, Indiana, and Michigan. The results of these studies were ambiguous, and the studies all suffered from serious methodological limitations. For example,

- The method of specifying control groups limited the confidence with which one could estimate what performance would have been in the absence of prospective reimbursement.
- It was difficult to distinguish PR program effects from effects due to the Economic Stabilization Program (ESP), which coincided almost completely with the years of program operation.

In addition to these methodological problems, the usefulness of the early evaluations was further eroded by the fact that many of the programs had undergone important changes by 1978, attempting to rectify early shortcomings; for example, they experimented with new approaches to budget review and reimbursement controls, and gave significantly greater legal authority to the programs.

Then, in 1978, HCFA funded this evaluation of PR programs in order to determine more definitively whether or not PR programs were effective in slowing the rate of inflation in hospital costs. The question could now be asked about a larger number of programs, and many of these programs had been in existence long enough to be considered mature and well developed. Originally, the study was to include 9 programs; it was later expanded to include 15.

Major Policy Issues Addressed by the Evaluation

When the study was undertaken in 1978, the major policy question at that time was:

- Is prospective reimbursement effective in reducing the rate of hospital cost inflation?

This question had still not been answered unambiguously by previous studies and was viewed as the most fundamental issue to be answered by this study. In the years since 1978, preliminary results from this study, as well as results of other studies, all indicate that many of the PR programs have indeed been successful in slowing the rate of hospital cost inflation. In an article published in the HCFA Review in late 1981, Coelen and Sullivan reported some preliminary findings from the NHRS based on their analysis of hospital financial data from the American Hospital Association's annual survey of hospitals, covering the period from 1969 to 1978. (Coelen, C., and Sullivan, D: An

- Only the first few years of program operation could be evaluated.

Programs that appear to be more stringent will be likely to bring greater pressure on their hospitals to contain cost inflation. Put another way, we might expect the more stringent programs to demonstrate greater effectiveness in reducing cost inflation. The programs fall into three groups: New York, Maryland, Washington, and New Jersey appear to be the most stringent programs; programs in Rhode Island, Connecticut, Massachusetts, Wisconsin, and Colorado constitute a second group, all legally mandated, but less stringent with respect to either their coverage or their rate-setting methods; finally, the other programs (Indiana, Kentucky, western Pennsylvania, Arizona, Minnesota, and Nebraska) fall into a third group, all voluntary programs, none with broad payer coverage, and none using very stringent rate-setting methods.

It is important to note that because of the way the characteristics cluster, it is not possible to determine the effects of individual characteristics. That is, we cannot separate the effects of a program's being mandatory from a program's having broad payer coverage or stiff rate-setting methods. We can, however, determine whether programs that appear to differ in relative stringency overall demonstrate differences in their abilities to restrain cost inflation.

One final comment on the variation in program characteristics: It should be very clear from the table that we are not evaluating one well-defined and uniform approach to hospital reimbursement in 15 different areas. Rather, we are using a common methodology to evaluate 15 distinct approaches to hospital reimbursement.

Nature of Evaluation

The NHRS has employed both a case study methodology and statistical analyses to evaluate the various prospective reimbursement programs. In the early part of the study, in-depth case studies were carried out. These case studies documented both the organizational structure of the programs and the specific operational characteristics of the rate-setting methodologies. These case study reports were published by HCFA in 1980 and were widely disseminated, assisting state and federal policy-makers and planners who have been involved in planning and implementing new or modified PR programs in the last few years.

The project has compiled data on almost 2,700 hospitals for each of the 10 years from 1970 to 1979, covering the period before and after the introduction of prospective payment. All nonfederal, acute care hospitals in the 15 states are included in the analyses, as well as a 25 percent random sample of similar hospitals in the remainder of the 48

contiguous states and the District of Columbia, which was used as a "comparison group."

Using a statistical model, we can, for example, compare the cost per day and the annual change in cost per day between hospitals under prospective reimbursement and hospitals in other states without PR. We are able to adjust for any differences that may have existed in the PR and comparison areas before the introduction of prospective reimbursement. We are also able to adjust for other factors that may have intervened during the period, such as differences in population characteristics, availability of physicians or nursing home beds, and the effects of regulatory programs like Certificate of Need, PSROs, and the Economic Stabilization Program.

Sources of Data

The two most important sources of data used in the study were the American Hospital Association (AHA) annual surveys and Medicare Cost Report data. The AHA and Medicare Cost Report data were used to study the impact of PR programs on hospital cost inflation, hospital financial status, volumes of services, productivity, and capital investment. Several other data bases were constructed to study other issues. To study the impact of prospective reimbursement on access to health services, a longitudinal data base, covering seven years, from the National Center for Health Statistics' Annual Health Interview Survey was constructed. To study the quality of care, a large patient-level data base was used, along with data on hospital accreditation status. A special file of Medicare utilization data was constructed to study the effects of PR on the use of other types of health services such as outpatient and long-term care. Finally, to study the impact of PR on the organization and management of hospitals, a survey of NHRS sample hospitals was carried out by the AHA in 1981.

The breadth and depth of the data that were used in this evaluation is extraordinary. Literally hundreds of measures of hospital performance were compiled for 40 percent of the nation's community hospitals for each of the 10 years from 1970-1979.

During the next year, we will be updating this data base to include data for 1980 and 1981. All of the major results that will be reported today for the period through 1979 will be updated through 1981 and will be available by next summer. A summary of the findings being reported today will be available early next year.

Effects of PR Programs on Hospital Expense

Various other studies in the past several years examined the effects of PR

analysis of the effects of prospective reimbursement programs on hospital expenditures. Health Care Financing Review: p. 1, Winter 1981.)

In summarizing their findings, they reported:

"The statistical evidence indicates that some PR programs have been successful in reducing hospital expenditures per patient day, per admission, and per capita. Eight programs have reduced the rate of increase in expenses by 2 percentage points or more per year and, in some cases, by as much as 4 to 6 percentage points."

Since these preliminary results were published in 1981, the evaluation team has been involved in constructing a data base and carrying out a series of analyses which greatly expand the scope of the evaluation beyond the basic question of whether or not PR programs reduce the growth of hospital expenditures. Many other issues with important policy implications are also being addressed. For example, if PR programs are successful in slowing hospital cost inflation, are there related effects on:

- The quality of patient care?
- The financial status of hospitals?
- The accessibility of hospital services?
- Costs in other sections of health care such as hospital outpatient care, physician services, and long-term care?

Another is whether and to what degree prospective reimbursement programs may be associated with either an increase or a reduction in "cost-shifting" among payer groups. Cost-shifting might simply be defined as the extent to which a particular payer of hospital services (Medicare, Medicaid, Blue Cross/Blue Shield, commercial insurers, or self-pay patients) pays more than or less than the costs incurred for the services used by its respective patient group.

Prospective reimbursement programs, depending on their features, may either increase or decrease cost-shifting. For example, some programs have explicitly set out to reduce cross-subsidization through realignment of costs and charges, whereas other programs have increased the potential for cost-shifting by excluding charge-based payers. To government agencies and to private health insurers, the extent to which prospective payment systems either increase or reduce cost-shifting is of considerable concern.

Another set of issues being studied focuses on how hospitals might achieve the observed reduction in cost inflation. PR programs operate by limiting the amount of

revenue that hospitals receive. Their effects on hospital expenditures depend on the ways in which hospital managers respond to the incentives of the reimbursement program. In studying hospital's responses to PR, the evaluation is focusing on a wide range of measures including:

- Volumes of services, for example, admission rates, occupancy rates, and length of stay.
- Productivity, including measures of staffing levels, composition of staff, and wage rates.
- Capital spending, including measures of new investment in plant and equipment.
- Hospital management activities, including specific cost-containment activities.

Another major area of the evaluation involves the comparative effectiveness of the 15 programs being studied. Are there major differences in program characteristics? Which programs are most effective? Is there a best or a better model?

The 15 programs included in the evaluation provide a good cross-section. First, as is indicated by the map in Figure 1, the 15 programs are spread out across the country, with Washington state in the Northwest, Arizona and Colorado in the Southwest, and the heaviest representation in the Midwest and the Northeast.

Table 1 provides a comparison of program characteristics for the 15 programs included in the evaluation. The table reflects the characteristics of these programs in 1978-1979, the period when our detailed case studies were carried out. The characteristics shown across the top include:

1. Whether program participation was legally mandated.
2. Whether the program included most of the payers.
3. Whether stiff criteria were applied in reviewing budgets.
4. The extent to which the program permitted negotiation.
5. Whether the program set actual payment rates as opposed to setting overall limits on hospital budgets and then expecting hospitals to set their rates accordingly.

A "yes" for any of these characteristics can be viewed as an indication that the program appears to be a more stringent one, at least for the characteristic indicated.

programs that were in place in the late 1970s, and they have generally concluded that the programs were effective in reducing the rate of increase of hospital expenditures per patient day, per case, and, in some instances, per capita. Our findings are, in fact, consistent with those other results. For 8 of the 15 programs, we found statistically significant reduction in hospital expenditures per adjusted patient day. The effects for the 8 programs were large. The rate of increase of hospital expenses per adjusted patient day fell as a result of the programs by two to five percentage points. Because programs were in existence for three, four, five, or more years, annual effects compound over time; by the end of a four-five year period, the effect on hospital expenses is quite substantial. To provide numbers that are as comparable as possible across programs, our estimates of program effects reflect the percentage reduction in hospital expenses at the end of a five year period.

The first column in Table 2 presents estimates of the effects of the eight programs on hospital expenditures per adjusted patient day in year five. The estimated effect on cost per patient day for New York illustrates the proper interpretation of the results: hospital expenditures under the program were 22 percent lower in the fifth year than they would have been had the program not been in effect. Our estimated five percentage point effect per year for the program in New York compounds over a five year period to a much larger percentage effect. The estimated cumulative effect of these eight programs--the total of the savings in the first year, the second year, etc.--is a savings of \$7.6 billion. There is one important qualification, however.

The second and third columns of the table indicate the adverse effects of substantial increases in length of stay which resulted from the programs. The old rate-setting programs, those in place before the advent of case-based reimbursement, had strong incentives for hospitals to increase the number of days per admission. The results indicate that those increases in length of stay were so large, in some instances, that they actually wiped out economies in cost per patient day. For the state of Washington, for example, the 12 percent reduction on cost per patient day was completely offset by a very substantial increase in length of stay. Looking at the effect of Washington's program on cost per admission, one finds that that effect is negative, but not statistically significant.

Only 5 of the 15 programs were effective in reducing costs per admission by a statistically significant amount. Increases in length of stay reduced the overall savings achieved by half. The \$7.6 billion savings that one would have expected from estimated

reductions in cost per patient day was reduced to \$3.8 billion. Thus, the overall average effect of the eight programs listed in Table 2 was reduced from an 18 percent savings to a 9 percent savings.

The last two columns in Table 2 indicate the effects of changes in hospital admissions on the savings achieved by programs. For all eight of the states shown, admissions per capita declined during the period when PR programs were operating relative to what was happening in other states. In only four of the eight cases, were the reductions in the admissions per capita large enough and consistent enough to be statistically significant. However, reductions in admissions, if one believes they are the result of the PR programs, end up adding to the effects of the programs on cost per admission and produce larger effects on cost per capita.

We have no convincing explanation for why the kinds of programs that were in effect during the last half of the 1970s should lead to reductions in admissions. Although the estimated effects of PR programs on length of stay are consistent with expectations, we cannot explain why hospitals had any incentives to reduce admissions. As a result, we recommend a conservative conclusion that, at worst, changes in admission did not offset the savings that the programs produced in cost per case.

A second important focus of the evaluation is the effects of prospective reimbursement programs on hospital revenue. Because PR programs are revenue-controlled programs, they have a direct effect only on hospital revenue. The effects they have on hospital expense come only indirectly and occur only to the extent that hospitals and physicians respond to the downward pressures on revenue by implementing various cost containment programs. If programs have no effect on hospital revenue, it is unreasonable to expect that they would have any effect on hospital expense. Furthermore, if the effects on revenue are relatively small, hospitals may be able to finance those shortfalls in other ways and may choose not to economize on staff, wage rates, supplies, and other components of expense.

Because hospital revenue measures the amount that people pay for hospital care, considerable importance should be attached to the effects of PR programs on hospital revenue per se. All 15 of the programs were associated with reductions in the rate of increase in net patient service revenue per adjusted patient day; for 12 of the programs the reductions were statistically significant. For the 3 programs for which estimated effects were not statistically significant, the estimated reductions were quite small--only 0.5 percentage points per year. For most programs, estimated reductions

were 2 percentage points or more; the New York program reduced the rate of growth of patient revenue by a very substantial 7.5 percentage points per year.

In virtually all cases, effects of programs on revenue were larger than effects on expenses. For the eight programs listed in Table 2, for example, average annual effects on expense per adjusted patient day, compounded over five years, produced an 18 percent savings in the fifth year. The comparable estimate for revenue per adjusted patient day is a savings of 25 percent. The differential effects of programs on revenues and expenses have very important implications for net income and operating margins for hospitals. We will return to these issues of financial status later.

Because of the extensive data available for this evaluation, it was possible to examine changes in reimbursement rates for individual payers. Rates of increase in Medicare reimbursement and in prices paid by charge-based payers were examined for all 15 programs. Because of the special data supplied by Blue Cross plans, it was possible to examine Blue Cross reimbursement also, but only for 11 of the 15 programs.

By and large, all payers benefited from the implementation of PR programs, whether they participated in the programs or not. Rates of increase of charges per adjusted patient day were lower for all 15 of the programs, and 10 of the estimated reductions were statistically significant. As mentioned, Blue Cross reimbursement was studied for only 11 programs; but for 10 of the 11 cases, Blue Cross achieved significant savings. Medicare achieved some savings even where they did not grant a waiver and remained on cost-based reimbursement, largely as a result of reductions in the rate of increase of hospital expenses. For 10 of the 15 programs, Medicare's savings were statistically significant.

Although all payers tended to benefit from a given program, not all benefited to the same degree. Blue Cross tended to benefit more than other payers in those programs which excluded charge-based payers. Charge-based payers benefited more than others in only a few of the programs: in Maryland, where the program attempted to realign costs and charges by department; in Connecticut, under its charge-control program; and in New York in 1978 and 1979, after controls were imposed on rates of increase in charges. As indicated, Medicare benefited in most programs. However, in relative terms, Medicare generally lost: if Medicare had done as well as participating payers in nonwaiver programs, it would have achieved an additional five percent savings on its payments in those states.

Differentials in the effects of some programs on reimbursement for various payers were large, and the differences have important implications for the competitive position of Blue Cross versus commercial insurance. The best illustration is found in New York in 1976 and 1977, before New York's charge-control program began. During that two year period, the rate of increase in charges per patient day was 6 percentage points below the average for hospitals not covered by PR. That is a large effect. For Blue Cross, however, the rate of increase in payments per patient day was 12 percentage points below the average for non-PR states. The 6 percentage point differential, even over a two year period, produces a significant change in competitive advantage. For example, if Blue Cross was operating with a modest 10 percent discount relative to charges in 1975, by the end of 1977 the 6 percentage point differential in program effect would have increased Blue Cross' discount relative to commercial insurers from 10 percent to a very substantial 27-28 percent.

Some may look at these differential effects on reimbursement across payers as a kind of cost-shifting. In a way, this interpretation is correct, for differential effects on rates of change cause reimbursement relative to average cost to change more over time for one payer than for another. The fear of some payers about PR programs, however, is that a more severe type of cost-shifting would occur. Several conditions must be met for this latter type of cost-shifting: participating payers impose a relatively stringent limit on the rate of increase of their reimbursement; hospitals are either unwilling or unable to lower the rate of increase of expenses commensurately; to cover some or all of the loss incurred on the patients of participating payers, the rate of increase of reimbursement for nonparticipating payers is set above the rate of increase in expenses. Reimbursement relative to average cost rises in absolute terms for nonparticipating payers to subsidize a decline in reimbursement relative to average cost for participating payers.

Among the 15 programs, the more severe type of cost-shifting occurred in only one place. In New Jersey, between 1975 and 1979, Blue Cross reimbursement fell relative to average expense per adjusted patient day, whereas payments from charge-based payers rose relative to average cost. It is important to note that the degree of cost-shifting was not particularly large in the case of New Jersey--charges rose slightly faster than cost, and Blue Cross payments rose slightly slower. In fact, relative to experience in states without PR, charge-based payers actually saved money as the result of the New Jersey program. Nevertheless, a gain in net income from one group of patients was used to offset a loss in net income from another group.

The analyses of fatality and readmission rates produced a large number of tests for relationships between PR and patient outcomes. We computed two fatality rates (in-hospital and within 180 days of admission) for each of four aggregations of the 68 categories of care-sensitive diagnoses/procedures (urgent care cases, elective surgery cases, heart attack cases, and the sum of all 68 categories of cases). These eight outcome measures (two rates for each of four types of cases) were then examined for 21 different PR programs or variants of programs;¹ so that 168 tests were made for relationships between PR and fatality rates. Only one readmission rate was computed, proportion of patients readmitted to any hospital for any reason within 90 days of discharge, but the four aggregations of diagnoses/procedures and 21 program versions yielded 84 tests.

The pattern of results for tests on fatality and readmission rates was what one would expect to find if, in fact, there was no association between PR and patient outcomes but a large number of tests had been made for the existence of a relationship. Of the 168 tests on fatality rates, 134 indicated no association, 24 indicated an adverse relationship, and 10 indicated a favorable relationship. Of the 84 tests on readmission rates, 63 implied no association, 12 implied an adverse relationship, and 9 implied a favorable relationship. The small percentage of statistically significant results occurred despite the fact that standard criteria for significance were relaxed. Furthermore, no systematic patterns existed among the significant results; adverse effects were found at least as often for weak PR programs (those with little or no effect on hospital expenses) as for strong programs, and favorable effects were similarly scattered across programs. Since some significant relationships will be found by accident between unrelated variables when multiple tests are made, we conclude that no systematic relationship existed between patient outcomes and the PR programs implemented during the 1970s.

Despite our conclusion, others may interpret the fact that some adverse relationships were found in the study of patient outcomes as a basis for concern. It is wise to keep in mind that our conclusion, of no association between PR and patient outcomes, is strictly applicable only to the programs we studied and only to the period of the 1970s. Continuation of the same or tougher programs in the 1980s might produce a different pattern of results.

The study of accreditation rates uncovered what may be a short-run adverse effect of PR. At the start of the 1970s, hospitals in PR states had accreditation rates about 10 percentage points higher than hospitals in other states. As accreditation criteria were tightened over the period, rates fell in all states. In 1975 and 1976, however, rates among hospitals in some of the tougher PR programs fell by a larger amount than rates among other hospitals. It is important to recognize that by 1978 and 1979 the initial 10 percentage point differential had been restored. Lacking detailed information on the accreditation criteria that PR hospitals had relative difficulty satisfying, we do not have a good basis for determining the seriousness of the short-run deterioration in accreditation under PR. We will examine accreditation rates with additional data in coming months.

Effects of PR Programs on Health Care Cost and Utilization Outside Hospitals

One of the objectives of the evaluation is determination of the degree to which some of the savings in hospital reimbursement and expenses might be offset by higher utilization and expenses for nonhospital health care. For example, does PR lead hospital-based physicians, whose services were previously reimbursed as part of the hospital's bill, to bill separately? Do hospitals discharge patients sooner, leading to more outpatient visits, more nursing home days, or more care from home health agencies? Data for a five percent sample of Medicare beneficiaries in each of 1,300 counties for the years 1974 to 1978 were used to address these questions.

There is no evidence to support the view that PR leads to increased use of nonhospital health care services and higher nonhospital health care costs. Among the programs examined, there were seven instances in which statistically significant associations were found between PR and nonhospital expenses. In all seven cases, nonhospital health care costs fell in conjunction with program implementation. Five instances were found of significant associations between PR and physician visits per Medicare beneficiary. In four of the five cases, visits went down; only in one instance were visits higher. Finding no good explanation for PR leading to reductions in nonhospital health care cost and utilization, we choose a conservative conclusion, that PR programs do not have an offsetting effect on nonhospital health care costs.

Mechanisms for Change

What happens within hospitals to bring about the estimated reductions in expenses? What are the sources of savings? These issues were addressed by several of the analyses of the study. A few mechanisms for

¹ When a program underwent substantial change, each version of the program was treated as a separate prospective reimbursement system.

change have already been mentioned--increases in length of stay (diminishes program effectiveness) as well as reductions in liquidity and increases in indebtedness (both less likely sources of "savings" in the future). What other changes occurred?

Hospital expenses were decomposed in two ways to identify the areas of operation most significantly affected by PR. An examination of program effects on expenses for routine versus ancillary departments yielded no systematic patterns: the largest effects for some programs were on costs for routine departments, but for other programs relative effects were equal or were largest for ancillary departments. In general, both payroll and nonpayroll expenses grew more slowly under PR than elsewhere, but the largest percentage point reductions were in nonpayroll expenses. Savings in payroll expense came largely in the form of slower rates of increase of hospital employment (not in the form of absolute reductions in staff). Employment of RNs appeared not to be affected by the programs, so the slower rates of increase in staff occurred only in other employment categories.

PR programs had little or no effect on hospitals' spending on buildings and equipment, nor did investment spending seem to be distributed differently among hospitals. Earlier in the study, using data only through 1978, we found that diffusion of various services among hospitals was slowed, but only to a small degree, as a result of PR, particularly in New York but to a lesser degree also in Maryland, Minnesota, New Jersey, Washington, and Wisconsin. (Cromwell, J., and Kanak, J.: The effects of prospective reimbursement programs on hospital adoption and service sharing. Health Care Financing Review: 67-88, Dec. 1982.) Only in New York did these changes in diffusion of services translate into a statistically significant reduction in aggregate investment outlays. During the 1970s, therefore, effects of PR on hospital expense did not arise from substantially lower rates of capital purchases.

The American Hospital Association conducted a special survey for the evaluation in late 1981 that allowed examination of potential differences in administrative procedures and accounting practices between hospitals covered and not covered by PR. No major differences were found. From among a large number of practices and procedures investigated, only preadmission testing, discharge planning, and use of financial consultants were more common among hospitals covered by PR programs than among other hospitals. As part of the survey, hospital administrators in PR states were asked for their subjective assessments of the effects of PR on their operations. About 13 percent believed that revenue limits had produced

some deterioration in quality or accessibility of hospital care; over 60 percent, however, indicated that PR had either not affected hospital operations or had lead to an improvement in their hospital's financial status.

Summary of Results

A number of the findings of the study are worth reviewing. PR reduced the rate of increase of hospital expense per admission in 5 programs by two percentage points a year. Significant effects on hospital revenue were found for 12 programs and were almost always larger than effects on expenses. Particularly in New York, where hospitals started the 1970s in the leanest financial position, some deterioration in financial status occurred. No adverse effects on patient outcomes and no offsetting increases in nonhospital health care costs occurred. Although length of stay rose as a result of many PR programs and offset half of the savings in cost per patient day, no increases in admissions were found to further reduce potential savings. All payers, participating or not, tended to benefit from PR, but the largest benefits were realized by payers included in the programs. Finally, it was hospitals, in the form of larger operation losses, rather than excluded payers who "financed" any shortfall in the difference between revenue and expense.

Implications for Medicare's Prospective Payment System

Built into Medicare's new prospective payment system (PPS) is a substantial savings for Medicare. Evidence from our analysis of PR programs during the 1970s suggests that other payers may benefit as well, to the extent that PPS exerts downward pressure on hospital costs. Evidence from the 1970s suggests further, however, that other payers would benefit more from an all-payer prospective reimbursement system.

The utilization incentives built into the new Medicare system are not only appropriate but very important. The adverse incentives in earlier PR programs for increases in length of stay substantially diminished program effectiveness. Medicare's system should lead to reductions in length of stay and thereby avoid a potentially large diminution of effect. Adverse changes in number of admissions could result from the new program, however; effective utilization review might offset this incentive.

The evidence from the National Hospital Rate-Setting Study should support those who are ready to proceed with prospective reimbursement as a hospital cost-containment device, but the evidence is more appropriately interpreted as giving a yellow light rather than a green one. Patient outcomes did not seem to be affected by PR during the 1970s,

Effects of PR Programs on Financial Viability of Hospitals

One of the most important areas of analysis in the study is the impact of PR on the financial status of hospitals. Data from income statements and balance sheets for a large sample of hospitals for all of the 1970s allowed examination of a number of financial indicators--margins (net income as a percent of revenue), indebtedness (long-term liabilities as a percent of total assets), and liquidity (current assets as a percent of current liabilities).

It is important for understanding the results of these analyses to be aware of the financial status of hospitals in the early 1970s, prior to the start of most PR programs. The average hospital was in a relatively strong financial position in the early 1970s. Long-term debt was relatively low, minimal compared to other industries. Liquidity was very high, substantially above that of the average manufacturing firm. Hospitals typically incurred small losses on services to patients, but offset these losses with income from other sources--parking lots, gift shops, etc. Asked to comment on financial indicators for the average hospital in the early 1970s from the perspective of rate of return on investment, a financial analyst probably would have recommended increases in long-term debt (higher leverage), conversion of working capital into other assets (higher rates of return), and other actions to increase profitability.

PR programs had clear effects on financial status. Because programs had larger effects on revenue than on expenses, operating losses increased under PR and by enough that it was no longer possible for hospitals to offset all of their losses on patient services from other sources of income. Operating in the red, hospitals could not use "profit" to finance the increases in working capital that are usually necessary over time to offset the effects of inflation. Liquidity declined, and long-term debt was used increasingly to finance purchases of plant and equipment. Just as large federal deficits lead to higher federal expenditures for interest in later years, higher indebtedness for hospitals mean higher health care costs in the future.

Because most hospitals started the 1970s in a very good financial position, the losses resulting from PR were sustainable without financial jeopardy by most hospitals. In a less strong financial position at the outset, hospitals might have responded to PR by more significantly reducing the rate of increase in expenses. One way of interpreting the evidence of PR effects on cost, revenue, and financial indicators is that PR caused a cost-shifting over generations. The relatively strong financial positions built up in the late 1960s and early 1970s, allowed hospitals

covered by PR to charge prices below average cost in the late 1970s.

In New York, the effects of PR on financial status were quite large. In that state, the impact of the program on hospital revenue was much larger than the impact on hospital expense. Of the savings that were achieved in New York on hospital reimbursement, a full 20-25 percent was "financed" in the form of operating losses. For the average New York hospital, liquidity fell below the accepted norm for the industry, and long-term debt rose faster than in other PR states. To fully appreciate the significance of the changes in New York, one must realize that hospitals in that state started the 1970s in a much leaner financial position than hospitals elsewhere.

The general issue with respect to financial viability of hospitals is not whether PR programs put hospitals out of business during the 1970s, but how close the programs pushed hospitals toward the edge. Clearly committed to prospective payment for hospitals in the 1980s, at least for Medicare, we must watch carefully that potentially more serious changes in financial status do not occur in the future.

Effects of PR Programs on Quality of Care

One area of potential impact of PR that we have known very little about to this point is quality of care. Quality of care was a major focus of this evaluation. It could not be measured directly, so we chose to examine a set of variables which we thought would be widely accepted as indicators of quality--in-hospital and 180-day-post-hospitalization fatality rates and 90-day-post-discharge readmission rates. We also examined accreditation rates of hospitals for evidence of adverse effects.

A methodology was chosen for the study of quality which maximized chances of detecting any adverse effects of PR which might exist. A very large sample was used--over 670,000 discharge records for the 1974-1979 period. Panels of physicians and hospital administrators selected categories of diagnoses and procedures for which patient outcomes were most likely to be adversely affected by cost-containment efforts; the 68 categories selected are referred to as care-sensitive groups. The patients for whom records were analyzed are Medicare patients, the frail, elderly group most likely to be at risk of adverse outcomes. Differences in severity of cases across hospitals and years was taken into account by statistical adjustments for age, sex, primary diagnosis, and whether or not there was a secondary diagnosis for each patient. Finally, we relaxed the standard statistical criteria for determination of whether or not an estimated effect is statistically significant.

and hospitals were able to absorb adverse effects on financial status. These are important areas of concern, however, and bear watching.

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15 Prospective Reimbursement Programs

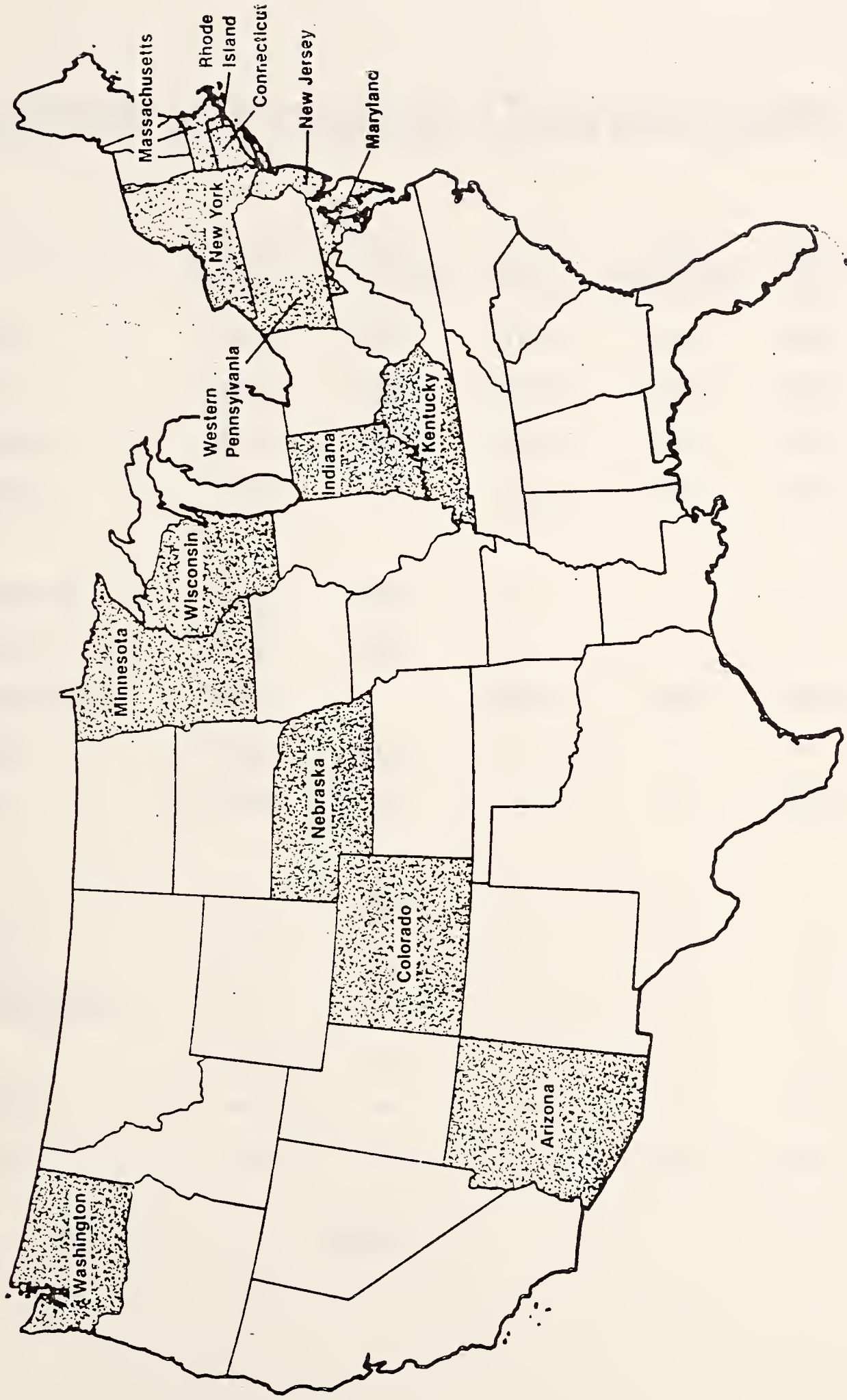


Figure 1

Comparison of Program Characteristics

	<u>Legally Mandatory</u>	<u>Broad Coverage</u>	<u>Stiff Criteria</u>	<u>Little Negotiation</u>	<u>Set Rates</u>
New York	Yes	Yes	Yes	Yes	Yes
Maryland	Yes	Yes	Yes	Yes	Yes
Washington	Yes	Yes	Yes	Yes	Yes
New Jersey	Yes	—	Yes	Yes	Yes
Rhode Island	Yes	Yes	—	—	..
Connecticut	Yes	Yes	—	—	..
Massachusetts	Yes		Part	Yes	Part
Wisconsin	Yes	Yes	—	—	—
Colorado	Yes	—	—	—	Yes
Indiana	—	Yes	—	—	—
Kentucky	—	—	—	—	—
W. Pennsylvania	—	—	—	—	—
Arizona	—	—	—	—	—
Minnesota	—	—	—	—	—
Nebraska	—	—	—	—	—

Table 1

Estimated Fifth-Year Effect (Percent)

<u>STATE</u>	<u>\$/DAY</u>	<u>LOS</u>	<u>\$/CASE</u>	<u>ADMs/POP.</u>	<u>\$/POP.</u>
New York	- 22	+ 10	- 13	- 4	- 15
Rhode Island	- 17	+ 7	- 10	- 2	- 10
Maryland	- 17	+ 8	- 9	- 1	- 4
Massachusetts	- 15	+ 12	- 4	- 8	- 10
Connecticut	- 14	+ 5	- 8	- 6	- 8
New Jersey	- 14	+ 9	- 6	0	- 3
Washington	- 12	+ 10	- 1	- 12	- 10
Kentucky	- 9	+ 9	+ 1	- 1	- 4

Estimates in bold-faced type are statistically significant.

Table 2



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University of California, San Diego

Year	Department	Course	Section	Time	Room
1981	Chemistry	101	1	9:00-10:00	Chem 101
1981	Chemistry	101	2	10:00-11:00	Chem 101
1981	Chemistry	101	3	11:00-12:00	Chem 101
1981	Chemistry	101	4	12:00-13:00	Chem 101
1981	Chemistry	101	5	13:00-14:00	Chem 101
1981	Chemistry	101	6	14:00-15:00	Chem 101
1981	Chemistry	101	7	15:00-16:00	Chem 101
1981	Chemistry	101	8	16:00-17:00	Chem 101
1981	Chemistry	101	9	17:00-18:00	Chem 101
1981	Chemistry	101	10	18:00-19:00	Chem 101
1981	Chemistry	101	11	19:00-20:00	Chem 101
1981	Chemistry	101	12	20:00-21:00	Chem 101
1981	Chemistry	101	13	21:00-22:00	Chem 101
1981	Chemistry	101	14	22:00-23:00	Chem 101
1981	Chemistry	101	15	23:00-24:00	Chem 101

University of California, San Diego, La Jolla, California 92037

1981

